

Features of New High-Strength Steel Materials

“550 N/mm² Class” for Building Frames

DE Steel o Mate als Se ces Ce te

Abstract:

JFE Steel developed a new line of high-strength steel products with a lower limit tensile strength of 550 N/mm² for building frames using its advanced Super-OLAC (on line accelerated cooling) accelerated cooling technology. This product series currently consists of a steel plate, “HBL385,” circular steel tube, “P-385,” and square steel tube, “P Column G385.” These products realize high strength and excellent earthquake resistance while maintaining the weldability of the conventional steel. The results of a test of members using the square tube confirmed that the cumulative ductility factor of 30, which is required in columns, can be sufficiently secured. A rolled H-shape steel, “HBL-H385,” is also under development. A design trial was carried out to in

Introduction

Introduction

2. Features of Products

Introduction

Table 1 Table 2

2.1 Steel Plate “HBL385”

Figs. 1 2 Table 3

Introduction



¹ Staff Dept Manager
Construction Engineering Sec.
Construction Engineering Section Dept.
Construction Materials Section Center
JFE Steel



³ Staff Dept General Manager
Construction Engineering Sec.
Construction Engineering Section Dept.
Construction Materials Section Center
JFE Steel

2.2 Carbon Steel Tube "P-385"

The carbon steel tube "P-385" is a standard JIS G3101 (A53) pipe. It is used for the main gas line. The material is carbon steel with a yield strength of 355 MPa and a tensile strength of 485 MPa. The tube is welded to the main gas line. The welding is done by the contractor. The welding is done by the contractor. The welding is done by the contractor.

2.3 Stainless Steel Tube "P-Co G385"

The stainless steel tube "P-Co G385" is a standard JIS SUS304 pipe. It is used for the main gas line. The material is stainless steel with a yield strength of 205 MPa and a tensile strength of 510 MPa. The tube is welded to the main gas line. The welding is done by the contractor. The welding is done by the contractor.

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

2014年10月27日 14:00:00

Table 6 Maximum member section

	□	□
	○	○

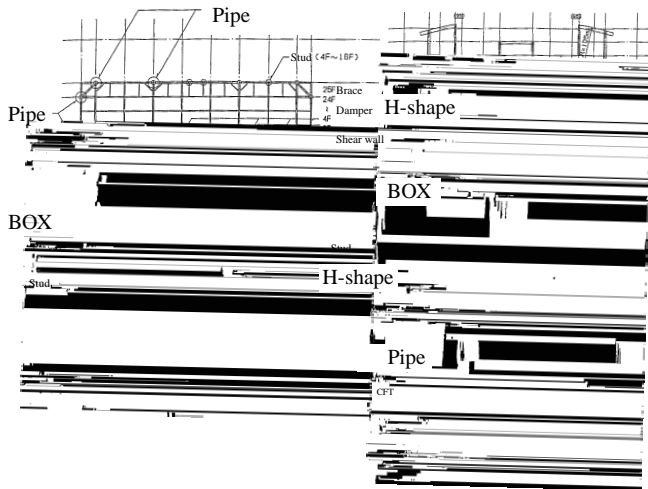


Fig.6 Building for trying to design

Table 7

	%	%	%	%	%
	%	%	%	%	%
	%	%	%	%	%
	%	%	%	%	%
	%	%	%	%	%

3.2 Results of Design

Table 7 Quantity of steel as a result of trying to design

	%	%	%	%	%
	%	%	%	%	%
	%	%	%	%	%
	%	%	%	%	%
	%	%	%	%	%

Table 8 Primary natural period as a result of trying to design

X		
Y		

Table 8 Primary natural period as a result of trying to design

X	
Y	

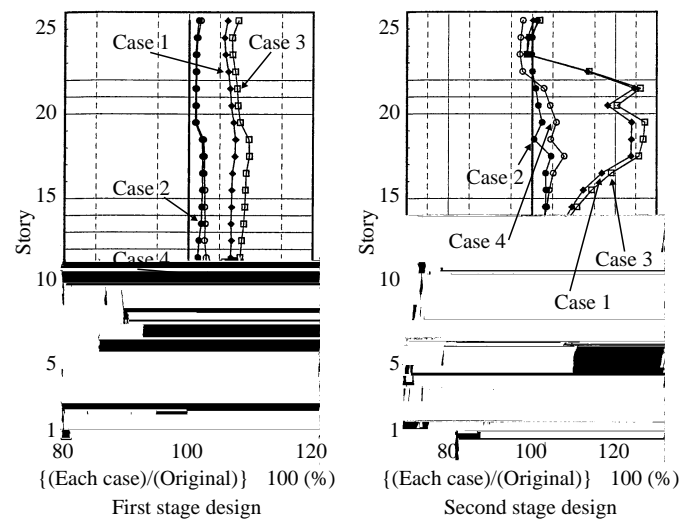


Fig.7 Story drift

Fig. 8

Figure 8 shows the results of the regression analysis. The dependent variable is the logarithm of the number of employees in the manufacturing sector. The independent variables are the logarithm of the number of employees in the service sector, the logarithm of the number of employees in the construction sector, the logarithm of the number of employees in the agriculture, forestry, and fishing sector, and the logarithm of the number of employees in the manufacturing sector. The regression coefficients are estimated by the ordinary least squares method. The results show that the logarithm of the number of employees in the service sector has a positive and significant effect on the logarithm of the number of employees in the manufacturing sector. The logarithm of the number of employees in the construction sector has a positive and significant effect on the logarithm of the number of employees in the manufacturing sector. The logarithm of the number of employees in the agriculture, forestry, and fishing sector has a negative and significant effect on the logarithm of the number of employees in the manufacturing sector. The logarithm of the number of employees in the manufacturing sector has a positive and significant effect on the logarithm of the number of employees in the manufacturing sector.

The results of the regression analysis are shown in Table 1. The dependent variable is the logarithm of the number of employees in the manufacturing sector. The independent variables are the logarithm of the number of employees in the service sector, the logarithm of the number of employees in the construction sector, the logarithm of the number of employees in the agriculture, forestry, and fishing sector, and the logarithm of the number of employees in the manufacturing sector. The regression coefficients are estimated by the ordinary least squares method. The results show that the logarithm of the number of employees in the service sector has a positive and significant effect on the logarithm of the number of employees in the manufacturing sector. The logarithm of the number of employees in the construction sector has a positive and significant effect on the logarithm of the number of employees in the manufacturing sector. The logarithm of the number of employees in the agriculture, forestry, and fishing sector has a negative and significant effect on the logarithm of the number of employees in the manufacturing sector. The logarithm of the number of employees in the manufacturing sector has a positive and significant effect on the logarithm of the number of employees in the manufacturing sector.

4. Conclusion

The results of the regression analysis are shown in Table 1. The dependent variable is the logarithm of the number of employees in the manufacturing sector. The independent variables are the logarithm of the number of employees in the service sector, the logarithm of the number of employees in the construction sector, the logarithm of the number of employees in the agriculture, forestry, and fishing sector, and the logarithm of the number of employees in the manufacturing sector. The regression coefficients are estimated by the ordinary least squares method. The results show that the logarithm of the number of employees in the service sector has a positive and significant effect on the logarithm of the number of employees in the manufacturing sector. The logarithm of the number of employees in the construction sector has a positive and significant effect on the logarithm of the number of employees in the manufacturing sector. The logarithm of the number of employees in the agriculture, forestry, and fishing sector has a negative and significant effect on the logarithm of the number of employees in the manufacturing sector. The logarithm of the number of employees in the manufacturing sector has a positive and significant effect on the logarithm of the number of employees in the manufacturing sector.